



## Configuring MVPNv6

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- [Prerequisites for MVPNv6, on page 1](#)
- [Restrictions for MVPNv6, on page 1](#)
- [Information about MVPNv6, on page 1](#)
- [How to Configure MVPNv6, on page 2](#)
- [Configuration Example for MVPNv6, on page 5](#)
- [Feature History for MVPNv6, on page 6](#)

### Prerequisites for MVPNv6

- BGP must be configured and operational on all devices sending or receiving multicast traffic.
- BGP extended communities must be enabled to support the use of Multicast Distribution Trees (MDTs) in the network. Use the **neighbor send-community both** or **neighbor send-community extended** command to enable BGP extended communities.
- VPN routing and forwarding (MVRF) instances to be used for MVPNv6 must be configured on the PE devices.

### Restrictions for MVPNv6

- Point-to-point GRE tunnel as an output interface in a VRF for MVPNv6 is not supported.

### Information about MVPNv6

To provide Layer 3 multicast services to customers with multiple distributed sites, service providers need a secure and scalable mechanism to transmit multicast traffic across the service-provider network. IPv4 Multicast VPN (MVPN) provides such services for IPv4 multicast traffic over a shared service provider backbone.

IPv6 Multicast Virtual Private Network (MVPNv6) provides the same services for IPv6 traffic, enabling service providers to provide multicast-enabled private IPv6 networks to their customers using their existing IPv4 back bone. The IPv4 and IPv6 VPN traffic is carried over the same tunnels simultaneously.

# How to Configure MVPNv6

## Configuring Multicast Routing

Perform this task to enable IPv4 and IPv6 multicast routing for the multicast VPN routing and forwarding (MVRF) instance to be used for MVPNv6.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. Enter your password if prompted.
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>ip routing</b> <b>Example:</b> Device(config)# ip routing	Enables IPv4 multicast routing.
<b>Step 4</b>	<b>ip routing vrf vrf-name</b> <b>Example:</b> Device(config)# ip routing vrf blue	Enables IPv4 multicast routing for the specified MVRF instance.
<b>Step 5</b>	<b>ipv6 routing</b> <b>Example:</b> Device(config)# ipv6 routing	Enables IPv6 multicast routing.
<b>Step 6</b>	<b>ipv6 routing vrf vrf-name</b> <b>Example:</b> Device(config)# ipv6 routing vrf blue	Enables IPv6 multicast routing for the specified MVRF instance.
<b>Step 7</b>	<b>exit</b> <b>Example:</b> Device(config)# exit	Exits global configuration mode.

## Configuring MVRP on PE Devices

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. Enter your password if prompted.
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>interface <i>type number</i></b> <b>Example:</b> Device(config)# interface GigabitEthernet 3/0/3	Enters interface configuration mode.
<b>Step 4</b>	<b>vrf forwarding <i>vrf-name</i></b> <b>Example:</b> Device(config-if)# vrf forwarding blue	Associates a VRF with the interface.
<b>Step 5</b>	<b>ip address <i>ip-address mask</i></b> <b>Example:</b> Device(config-if)# ip address 10.1.0.1 255.255.0.0	Configures an IPv4 address on the interface.
<b>Step 6</b>	<b>ip pim sparse-mode</b> <b>Example:</b> Device(config-if)# ip pim sparse-mode	Enables Protocol Independent Multicast (PIM) on the interface.
<b>Step 7</b>	<b>delay <i>tens-of-seconds</i></b> <b>Example:</b> Device(config-if)# delay 1000	Configures delay value on the interface.
<b>Step 8</b>	<b>ipv6 address <i>ipv6-address link-local</i></b> <b>Example:</b> Device(config-if)# ipv6 address FE80::20:1:1 link-local	Specifies a link-local IPv6 address. This address is used instead of the link-local address that was automatically configured when IPv6 was enabled on the interface.
<b>Step 9</b>	<b>ipv6 address <i>ipv6-address-prefix</i></b> <b>Example:</b> Device(config-if)# ipv6 address FC00::/7	Configures an IPv6 address on the interface.

	Command or Action	Purpose
<b>Step 10</b>	<b>ipv6 pim</b> <b>Example:</b> Device(config-if)# ipv6 pim	Enables Protocol Independent Multicast (PIM) for IPv6.
<b>Step 11</b>	<b>exit</b> <b>Example:</b> Device(config-if)# exit	Exits interface configuration mode.
<b>Step 12</b>	<b>ip pim rp-address ip-address</b> <b>Example:</b> Device(config)# ip pim rp-address 10.10.10.10	Configure the address of a PIM rendezvous point (RP) for multicast groups.
<b>Step 13</b>	<b>ip pim vrf vrf-name rp-address address</b> <b>Example:</b> Device(config)# ip pim vrf blue rp-address 10.10.0.10	Configures the IPv4 address of a PIM RP and associates the RP with the specified MVRF instance.
<b>Step 14</b>	<b>ipv6 pim vrf vrf-name rp-address ipv6-address</b> <b>Example:</b> Device(config)# ipv6 pim vrf blue rp-address FC00::1:1:1	Configures the IPv6 address of a PIM RP and associates the RP with the specified MVRF instance.
<b>Step 15</b>	<b>exit</b> <b>Example:</b> Device(config)# exit	Exits global configuration mode.

## Configuring Routing Protocols Between the PE and CE Devices

### Before you begin

The PE and CE devices must be configured with the same routing protocol.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. Enter your password if prompted.
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.

	Command or Action	Purpose
<b>Step 3</b>	<b>router bgp <i>as-number</i></b> <b>Example:</b> Device(config)# router bgp 55	Specifies the number of an autonomous system that identifies the device to other BGP devices.
<b>Step 4</b>	<b>address-family ipv6 vrf <i>vrf-name</i></b> <b>Example:</b> Device(config-router)# address-family ipv6 vrf blue	Specifies the name of the VRF to associate with subsequent address family configuration mode commands.
<b>Step 5</b>	<b>redistribute connected</b> <b>Example:</b> Device(config-router-af)# redistribute connected	Redistributes the directly connected networks to BGP.
<b>Step 6</b>	<b>redistribute eigrp <i>as-number</i></b> <b>Example:</b> Device(config-router-af)# redistribute eigrp 11	Redistributes the EIGRP routes into BGP.
<b>Step 7</b>	<b>redistribute static</b> <b>Example:</b> Device(config-router-af)# redistribute static	Redistribute the static routes into BGP.
<b>Step 8</b>	<b>end</b> <b>Example:</b> Device(config-router-af)# end	Returns to privileged EXEC mode.

## Configuration Example for MVPNv6

The following is an example for configuring MVPNv6:

```

mls ipv6 vrf
!
vrf definition blue
 rd 55:1111
 route-target export 55:1111
 route-target import 55:1111
!
 address-family ipv4
  mdt default 232.1.1.1
 exit-address-family
!
 address-family ipv6
  mdt default 232.1.1.1
 exit-address-family
!

ip multicast-routing

```

```

ip multicast-routing vrf blue
!
!
ipv6 unicast-routing
ipv6 multicast-routing
ipv6 multicast-routing vrf blue
!

interface GigabitEthernet3/0/3
 vrf forwarding blue
 ip address 10.1.0.1 255.255.255.0
 no ip redirects
 no ip proxy-arp
 ip pim sparse-dense-mode
 delay 100
 ipv6 address FE80::20:1:1 link-local
 ipv6 address FC00::/7
 no mls qos trust
!
router bgp 55
 address-family ipv6 vrf blue
  redistribute connected
  redistribute eigrp 11
  redistribute static
 exit-address-family
!

ip pim vrf blue rp-address 10.10.0.10
!
ipv6 pim vrf blue rp-address FC00::1:1:1
!
!
```

## Feature History for MVPNv6

This table provides release and related information for features explained in this module.

These features are available on all releases subsequent to the one they were introduced in, unless noted otherwise.

Release	Feature	Feature Information
Cisco IOS XE Gibraltar 16.11.1	MVPNv6	<p>This feature enables service providers to use their existing IPv4 back bone to provide multicast-enabled private IPv6 networks to their customers.</p> <p>This feature was introduced on the C9500-12Q, C9500-16X, C9500-24Q, and C9500-40X models of the Cisco Catalyst 9500 Series Switches.</p>

Release	Feature	Feature Information
Cisco IOS XE Amsterdam 17.3.1	MVPNv6	Support for this feature was introduced on the C9500-32C, C9500-32QC, C9500-48Y4C, and C9500-24Y4C models of the Cisco Catalyst 9500 Series Switches.

Use Cisco Feature Navigator to find information about platform and software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>.

